10 - CHAPTER 4 REVIEW NAME: _____ EX: 4.2

This review package can be completed as we work through the chapter or at the latest the night before the review class for the chapter test. Use it as an on-going review or as a study booklet right before the test. The answers will be posted during the review class before the chapter test.

List each of the following:

a) natural numbers less than 4

1, 2, 3

b) whole numbers less than 0

none!

State whether each number is rational or irrational.

a) $2.\overline{34}$ Q

b) π Q'

c) 4.010010001.. Q'

d) $-3.181818..$ Q

Consider the list of numbers: $-12,\ -2.7,\ 0,\ \frac{2}{3},\ \pi,\ \sqrt{13},\ 4.21,\ 50$

From these numbers, list all the:

a) natural numbers 50

b) whole numbers 0, 50

c) integers $-12, 0, 50$

d) rational numbers $-12, -2.7, 0, 4.21, \frac{2}{3}, 50$

e) irrational numbers $\pi, \sqrt{13}$

f) real numbers $-12, 2.7, 0, \frac{2}{3}, \pi, \sqrt{13}, 4.21, 50$

10 . - CHAPTER 4 REVIEW NAME: _____ EX: 4.3

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Write each radical in simplest form.

a) $\sqrt{48} = \sqrt{16}\cdot\sqrt{3}$
$= 4\sqrt{3}$

b) $\sqrt{72} = \sqrt{36}\cdot\sqrt{2}$
$= 6\sqrt{2}$

c) $\sqrt{45} = \sqrt{9}\cdot\sqrt{5}$
$= 3\sqrt{5}$

d) $\sqrt{160} = \sqrt{16}\cdot\sqrt{10}$
$= 4\sqrt{10}$

Write each radical in simplest form. (mixed radical)

a) $\sqrt[3]{54} = \sqrt[3]{27}\ \sqrt[3]{2}$
$= 3\sqrt[3]{2}$

b) $\sqrt[3]{48} = \sqrt[3]{8}\cdot\sqrt[3]{6}$
$= 2\sqrt[3]{6}$

c) $\sqrt[3]{80} = \sqrt[3]{8}\cdot\sqrt[3]{10}$
$= 2\sqrt[3]{10}$

d) $\sqrt[3]{250}$
$= \sqrt[3]{125}\cdot\sqrt[3]{2}$
$= 5\sqrt[3]{2}$

Write each mixed radical as an entire radical.

a) $2\sqrt{5} = \sqrt{2^2}\sqrt{5}$
$= \sqrt{4\cdot5}$
$= \sqrt{20}$

b) $7\sqrt{2} = \sqrt{7^2}\cdot\sqrt{2}$
$= \sqrt{49\cdot2}$
$= \sqrt{98}$

c) $3\sqrt[3]{4}$
$= \sqrt[3]{3^3}\cdot\sqrt[3]{4}$
$= \sqrt[3]{27\cdot4}$
$= \sqrt[3]{104}$

d) $5\sqrt[3]{3}$
$= \sqrt[3]{5^3}\cdot\sqrt[3]{3}$
$= \sqrt[3]{125\cdot3}$
$= \sqrt[3]{375}$

10. : - CHAPTER 4 REVIEW NAME: _____ EX: 4.4

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Evaluate each power without using a calculator.

a) $\left(\frac{16}{25}\right)^{\frac{1}{2}} = \sqrt{\frac{16}{25}} = \frac{4}{5}$

b) $32^{\frac{1}{5}} = \sqrt[5]{32} = 2$

c) $4^{\frac{3}{2}} = \left(\sqrt{4}\right)^3 = 2^3 = 8$

d) $(-125)^{\frac{2}{3}} = \left(\sqrt[3]{-125}\right)^2 = (-5)^2 = 25$

Write each power as a radical.

a) $45^{\frac{3}{2}} = \left(\sqrt{45}\right)^3$ or $\sqrt{45^3}$

b) $\left(\frac{2}{3}\right)^{0.75} = \left(\frac{2}{3}\right)^{\frac{3}{4}} = \sqrt[4]{\left(\frac{2}{3}\right)^3}$ or $\left(\sqrt[4]{\frac{2}{3}}\right)^3$

Write each radical as a power.

a) $\sqrt{7.1^5} = 7.1^{\frac{5}{2}}$

b) $\sqrt[3]{\left(\frac{6}{7}\right)^2} = \left(\frac{6}{7}\right)^{\frac{2}{3}}$

10 - CHAPTER 4 REVIEW NAME: _____ EX: 4.5

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Evaluate each power without using a calculator.

a) 5^{-2} $= \frac{1}{5^2} = \frac{1}{25}$

b) 2^{-3} $= \frac{1}{2^3} = \frac{1}{8}$

c) $\left(-\frac{1}{3}\right)^{-2}$ $= (-3)^2 = 9$

d) $\left(\frac{9}{16}\right)^{-\frac{3}{2}}$ $= \left(\frac{16}{9}\right)^{\frac{3}{2}} = \left(\sqrt{\frac{16}{9}}\right)^3 = \left(\frac{4}{3}\right)^3 = \frac{64}{27}$

Write each power with a positive exponent.

a) 4^{-6} $= \frac{1}{4^6}$

b) $(-5)^{-3}$ $= \frac{1}{(-5)^3}$

c) $\left(\frac{1}{2}\right)^{-4}$ $= (2)^4$

d) $\left(\frac{4}{3}\right)^{-3}$ $= \left(\frac{3}{4}\right)^3$

10: - CHAPTER 4 REVIEW NAME: _____ EX: 4.6

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Write as a single power with a positive exponent.

a) $x^{12} \bullet x^3$

$= x^{15}$

b) $(x^{12})^3$

$= x^{36}$

c) $(a^2 \bullet a^{-4})^3$ ← PEDMAS!

$= (a^{-2})^3$

$= a^{-6} = \frac{1}{a^6}$

d) $\frac{x^{12}}{x^3}$

$= x^9$

Simplify. Show your work. write with positive exponents. PEDMAS!

a) $\frac{(2a^2b^3)^{-2} \bullet (4ab^{-1})^3}{(a^3b)^{-4}}$

$= \frac{(2^{-2}a^{-4}b^{-6})(4^3a^3b^{-4})}{a^{-12}b^{-4}}$

$= \frac{(\frac{1}{4} \bullet 64)(a^{-1})(b^{-10})}{a^{-12}b^{-4}}$

$= 16a^{-1-(-12)}b^{-10-(-4)}$

$= 16a^{11}b^{-6}$

$= \frac{16a^{11}}{b^6}$

b) $\left(\frac{4^{-2}x^2y^{-3}}{x^{-2}y}\right)^3\left(\frac{8^{-1}x^{-3}y}{x^3y^{-1}}\right)^{-2}$ ← PEDMAS

$= \left(4^{-2}x^{2-(-2)}y^{-3-1}\right)^3\left(8^{-1}x^{-3-3}y^{1-(-1)}\right)^{-2}$

$= (4^{-2}x^4y^{-4})^3(8^{-1}x^{-6}y^2)^{-2}$ ← PEDMAS

$= (4^{-6}x^{12}y^{-12})(8^2x^{12}y^{-4})$

$= \left(\frac{1}{4^6}\right)(64)(x^{12+12})(y^{-12-4})$

$= \left(\frac{1}{4096}\right)(64)x^{24}y^{-16}$

$= \frac{1}{64}x^{24}y^{-16}$

$= \frac{x^{24}}{64y^{16}}$